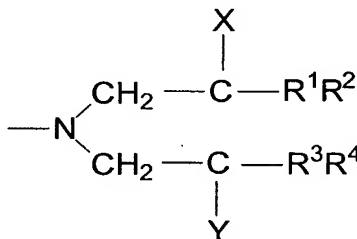


REMARKS

The Office Action of May 6, 2004, has been reviewed and the Examiner's comments carefully considered. Claims 1, 2, 4-22, 24-28, 30-49, and 57-114 are pending in the application. Claims 3, 23, 29, and 50-56 have been cancelled. Claims 57-114 have been withdrawn from consideration by the Examiner. Claims 112 and 114, while withdrawn from consideration by the Examiner, have been amended in a manner similar to claim 1. Applicants expressly reserve the right to file divisional applications on the subject matter of the withdrawn claims.

The amendments to the claims are supported in original claim 23. No new matter has been added and Applicants submit that these amendments place all of the remaining claims in condition for allowance.

Accordingly, the claims now recite an improvement to a process for coating an electroconductive substrate, the improvement comprising the presence in the curable electrodepositable coating composition of one or more cationic amine salt group-containing resins wherein the amine salt groups are derived from pendant and/or terminal amino groups having the following structure:



wherein R¹, R², R³, and R⁴ are the same or different, and each independently represents H or C₁ to C₄ alkyl; and X and Y can be the same or different, and each independently represents a hydroxyl group or an amino group; and wherein the coated substrate formed in step (a) is heated in an atmosphere having 5 parts per million or less of NO_x to a temperature and for a time sufficient to cure the electrodeposited coating on the substrate.

Restriction Requirement

The Examiner has indicated that claims 1-114 are subject to a restriction requirement. Specifically, the Examiner suggested that there are four distinct groups of claims, namely Group I, claims 1-56, drawn to an electrocoating process, classified in class 204, subclass 471+; Group II, claims 57-59, drawn to a multi-layer composite coating composition, classified in class 428, subclass 462; Group III, claims 98-111, drawn to a curable coating composition, classified in class 428, subclass 462; and Group IV, claims 112-114, drawn to an electrocoating process, classified in class 204, subclass 471+. Applicants thank the Examiner for indicating that the inventions of the various groups are patentably distinct from each other. However, the Applicants respectfully traverse the restriction for the following reasons. (Please note, in view of the traversal of the restriction requirement the listing of claims above includes two designations (e.g. "Withdrawn; Currently Amended") for some of the currently withdrawn claims as well as a complete listing of the claim language of these claims.)

The Examiner offers no reasons for distinctness between Groups I and III, as is required by Manual of Patent Examining Procedure §816, where it states: "The particular reasons relied on by the examiner for holding that the inventions as claimed are either independent or distinct should be concisely stated. A mere statement of conclusion is inadequate. The reasons upon which the conclusion is based should be given." Applicants respectfully submit that the restriction requirement is therefore incomplete.

Regarding Groups I and IV, the Examiner asserts in paragraph 4 of the Office Action of May 6, 2004, that the inventions of Groups I and IV are unrelated, suggesting that the different inventions have different functions: "one with a specified partially blocked polyisocyanate curing agent and the other with a specified cationic salt group-containing resin." Applicants respectfully submit that Groups I and IV encompass claims of differing scope (which may be patentably distinct from each other.) Claim 1 of Group I recites an at least partially blocked aliphatic polyisocyanate curing agent, while claim 112 of Group IV does not recite the aliphatic limitation. In addition, the various types of polymers recited in claim 112 of Group IV are also recited in claim 6 of Group I. Moreover, Applicants note that the inventions of Groups I and IV are classified in the same class and subclass. Therefore, the statement made by the Examiner in paragraph 6 of the Office Action,

i. e., “the search required for Group I is not required for either of Groups II-IV....” is incorrect.

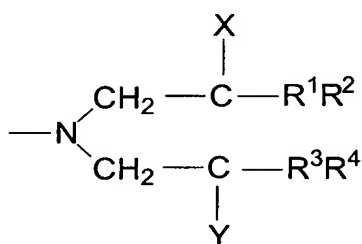
Regarding the relationship between Groups I and IV and Groups III and IV, respectively, again the Examiner offers no reasons for distinctness therebetween, as required by Manual of Patent Examining Procedure §816. As is further noted in §816, “Each other relationship of claimed invention should be similarly treated and the reasons for the conclusions of distinctness of invention as claimed set forth.” In other words, reasons for the distinctness of each group from *each and every* other group must be presented for the restriction requirement to be complete. Applicants respectfully submit that the restriction requirement is further incomplete.

Applicants further note that claims 60-97 are not addressed at all in the restriction requirement, other than in an indication that they are withdrawn from consideration. Applicants assume that claims 60-78 are included in Group II, being drawn to a multi-layer composite coating. However, the status of claims 79-97 is unclear with respect to the nature of distinctness from each of the other groups. Reconsideration and withdrawal of the restriction requirement are respectfully requested.

REJECTIONS

Claims 1-22 have been rejected under 35 U.S.C. §103(a) as being unpatentable over JP 2000-281943A in view of either Faul et al. (US 5,258,460) or Schupp et al. (US 5,096,555). The Examiner asserts that the Japanese reference discloses a high weatherability electrodeposited paint composition and method, comprising all the steps as claimed. The Examiner concedes that the reference is deficient in that there is no teaching of terminal or pendant amino groups on the polymeric backbones. The Examiner relies on either Faul or Schupp for a teaching of terminal and pendant amino groups on electrodepositable resins, and concludes that it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the Japanese reference's teachings as suggested by either Faul or Schupp because the selection of any of known equivalent cationic amine salt group-containing resins would have been within the level of ordinary skill in the art.

Applicants respectfully disagree with the Examiner's rejection and conclusions regarding claims 1-22 in light of the present amendment. The present invention is drawn to an improvement to a process for coating an electroconductive substrate, the improvement comprising the presence in the curable electrodepositable coating composition of one or more cationic amine salt group-containing resins wherein the amine salt groups are derived from pendant and/or terminal amino groups having the following structure:



wherein R¹, R², R³, and R⁴ are the same or different, and each independently represents H or C₁ to C₄ alkyl; and X and Y can be the same or different, and each independently represents a hydroxyl group or an amino group; and wherein the coated substrate formed in step (a) is heated in an atmosphere having 5 parts per million or less of NO_x to a temperature and for a time sufficient to cure the electrodeposited coating on the substrate. None of the references, taken alone or in any combination, teach or suggest the method of the present invention, i. e., a method coating an electroconductive substrate using the composition recited above, including the step of heating in an atmosphere having 5 parts per million or less of NO_x, as recited in the instant claims. In fact, the references are silent on the method of heating the substrate during cure because no advantages are recognized by the references of the use of a low NO_x atmosphere. In contrast, in the process of the present invention, there is a distinct advantage noted to heating the substrate in a low NO_x atmosphere. As shown in Tables 1 and 2 of the Specification, there are marked improvements in adhesion, in particular intercoat adhesion for coatings cured in an electric (low NO_x) oven compared to a gas oven, in processes of the present invention. Reconsideration and withdrawal of the rejection is respectfully requested.

Claims 23-48 have been rejected under 35 U.S.C. §103(a) as being unpatentable over JP 2000-281943A in view of either Faul et al. or Schupp et al., and further in view of Corrigan (US 5,385,962). The Examiner relies on the Japanese, Faul and Schupp references as above, and further relies on Corrigan for a teaching of heating done by any convenient method such as by baking in ovens or with banks of infrared heat lamps. The Examiner concludes that the selection of any of known equivalent heatings would be within the level of ordinary skill in the art.

Applicants respectfully disagree with the Examiner's rejection and conclusions regarding claims 23-48. Corrigan assumes that bake ovens and infrared heat lamps are equivalent. However, on page 42, lines 22-25 of the instant specification, it is noted: "The presence of NO_x in the curing ovens can create an oxidizing atmosphere which can result in interlayer delamination between the cured electrodeposited coating and any subsequently applied top coats upon weathering exposure." This observation and other examples of adhesion loss due to NO_x are demonstrated in the data shown in Tables 1 and 2, referred to above. There is no teaching or suggestion in any of the references, taken alone or in any combination, to use a low NO_x environment during curing of electrodeposited coatings as is contemplated by and claimed as the present invention. While Corrigan notes several alternative methods of cure, they are assumed by Corrigan to be equivalent and no appreciation for the unexpected adhesion results obtained by the process of the present invention is apparent. One would not be led by a reading of Corrigan to modify the process of the Japanese reference or any of the other references by curing with infrared lamps because no advantages of doing so are offered by Corrigan.

Claim 49 has been rejected under 35 U.S.C. §103(a) as being unpatentable over JP 2000-281943A in view of either Faul et al. or Schupp et al. and Corrigan as above, and further in view of Armstrong. The Examiner relies on Armstrong for a teaching of the use of yttrium in an electrodeposition process. The Examiner concludes that "the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the references' teachings as suggested by Armstrong because this would result in a coated substrate with high resistance to corrosion."

Applicants respectfully disagree with the Examiner's rejection and conclusions regarding claim 49. Armstrong does nothing to overcome the fundamental deficiencies of other references in teaching the present invention. There is no

teaching or suggestion in Armstrong that heating in a low NO_x atmosphere would be effective for improving adhesion of an electrodeposited coating composition. The references taken alone or in combination fail to teach the method of the present invention.

The additional rejections presented by the Examiner in the Office Action are deemed to be moot in light of the cancellation of claims 50-56.

In conclusion, it is believed that Applicants' claims as amended are patentable over the prior art. None of the references, taken alone or in any combination, teach or suggest a process for coating an electroconductive substrate comprising the following steps:

(a) electrophoretically depositing on the substrate a curable electrodepositable coating composition to form a coated substrate having an electrodeposited coating over at least a portion thereof,

the electrodepositable coating composition comprising a resinous phase dispersed in an aqueous medium, said resinous phase comprising:

(1) one or more ungelled active hydrogen-containing, cationic amine salt group-containing resins which are electrodepositable on a cathode, and

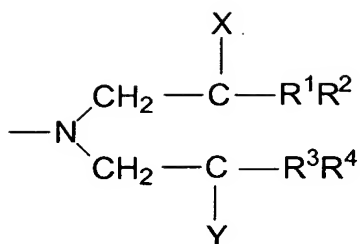
(2) one or more at least partially blocked aliphatic polyisocyanate curing agents;

(b) heating the coated substrate to a temperature and for a time sufficient to cure the electrodeposited coating on the substrate;

(c) applying directly to the cured electrodeposited coating one or more pigment-containing coating compositions and/or one or more pigment-free coating compositions to form a top coat over at least a portion of the cured electrodeposited coating;

(d) heating the coated substrate of step (c) to a temperature and for a time sufficient to cure the top coat, the cured top coat having at least 0.1 percent light transmission measured at 400 nanometers,

the improvement comprising the presence in the curable electrodepositable coating composition of one or more cationic amine salt group-containing resins wherein the amine salt groups are derived from pendant and/or terminal amino groups having the following structure (II):



(II)

wherein R¹, R², R³, and R⁴ are the same or different, and each independently represents H or C₁ to C₄ alkyl; and

X and Y can be the same or different, and each independently represents a hydroxyl group or an amino group; and wherein the coated substrate formed in step (a) is heated in an atmosphere having 5 parts per million or less of NO_x to a temperature and for a time sufficient to cure the electrodeposited coating on the substrate.

Therefore, reconsideration and withdrawal of the rejection of the claims is respectfully requested. The Examiner will be contacted for a telephonic interview on Wednesday, August 25, 2004, to discuss this proposed amendment.

Respectfully submitted,



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Pittsburgh, Pennsylvania
 August 30, 2004